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EDUCATION:

Ph.D., Information Technology and Engineering, George Mason University, 1989

M.S. in planning, The Pennsylvania State University, 1975

M.A. in mathematics, The Pennsylvania State University, 1971

B.A. in mathematics with high honors, Harpur College, Binghamton, New York, 1970

Additional graduate courses: computer science and mathematics, The Pennsylvania State University, 1971-1976;
biostatistics, Georgetown University, Washington, DC, 1977-1978

Honorary Doctor of Humane Letters, Binghamton University, May 2000

EMPLOYMENT:

Institute for Information Infrastructure Protection, September 2010 to present. Director of Research. Technical lead for a consortium of 27 major universities, national laboratories and think tanks that work together to examine important issues in information infrastructure protection. Projects address cyber security, dependability, safety, reliability and other aspects of information infrastructure protection. Sources of funding include both government and private enterprise. Projects are multi-institution and multi-disciplinary, and audiences include policy- and decision-makers as well as technologists and users.

RAND Corporation, March 2002 to August 2010. Senior information scientist. Worked with government and private organizations to analyze how information technology supports their mission. Projects focused on strategic planning, policy analysis and decision-making; economics of cyber security; security and privacy issues; insider threat; software cost estimation; information assurance; critical infrastructure protection; measurement and evaluation. Clients have included National Institute of Standards and Technology, Department of Homeland Security, US Air Force, US Patent and Trademark Office, Freddie Mac, US Department of Justice, Defense Advanced Research Projects Agency, Office of Science and Technology Policy, Defense Director of Information Assurance, Bureau of Justice Statistics, US intelligence agencies, US Army.

Recent projects include:

Leveraging Behavioral Science to Reduce Cyber Risk. Research to examine how to apply behavioral science findings to security technology. Funded by the Department of Homeland Security through the Institute for Information Infrastructure Protection, including participation by researchers at MITRE and Dartmouth.

Usability and Security. In conjunction with researchers from NIST and University College London, we looked broadly at how and why the lack of usability prevents security products and processes from being effective. The goal was to produce an initial set of NIST guidelines for evaluating the usability of security products and processes during their design, construction and evolution.

Cyber Security Metrics. Led two projects, one internally funded and one DoD-funded, to develop ways to measure the security of a computer system or network.

Human Behavior, Awareness and Insider Threat. Led project to investigate how to identify cyber security threats from insiders who have legitimate access to system and networks. Funded by the Department of Homeland Security through the Institute for Information Infrastructure Protection. Led teams from Indiana University, Dartmouth College, Columbia University, Cornell University, Purdue University, MITRE and RAND. Emphasis was on multidisciplinary look not only at how technology can support behavior recognition but also on ethical and legislative issues, risk management, and incentives for appropriate behavior.

Economics of Cyber Security. Led project to determine how best to make decisions about investing in cyber security. Funded by the Departments of Homeland Security and Justice through the Institute for Information Infrastructure Protection. Led teams from RAND, MIT Lincoln Laboratory, Dartmouth Tuck Business School, George Mason Law

School, and University of Virginia in providing multidisciplinary view of how to present a business case for cyber security. Included analyses of existing models and framework to understand when to use which models; analysis of current data sources and their pros/cons; recommendations for behavioral, organizational and cultural factors that models should consider; case study of cyber security investment decisions by businesses in the “Internet supply chain.” Products: Paper in *Cutter IT Journal*, papers published in *IEEE Security and Privacy*, *IEEE Software*, *IEEE IT Professional*. Similar issues addressed in follow-on I3P project on **Business Rationale for Cyber Security**.

Collecting the Dots. Internal research project to investigate how we know when information is important enough to report it to someone else. Addressed issues of how to communicate the information without flooding the recipient. Proposed initial architecture for a decision support system to help identify emergent situations. Product: Monograph on problem analysis and solution elements.

State Spam and Privacy Laws: An Overview and Analysis. Led project to analyze the current (at the time) state laws related to spam, as well as state and national laws relating to privacy. Funded by the Office of Science and Technology Policy. Products: Memorandum to OSTP with analysis and recommendation; article in *IEEE Security and Privacy*.

Privacy Implications of the Secure Flight Program. Led project to assist the Transportation Security Administration in assessing the privacy implications of its (at that time) proposed Secure Flight program. Product: Facilitated series of meetings of the Secure Flight Working Group, including background analyses of key issues.

Improving the Small Business Innovation Research (SBIR) Program Performance Across the Department of Defense. Member of team that surveyed SBIR recipients and MDAP organizations to determine best practices for SBIR performance. Product: Briefing about findings and best practices.

Software Cost Estimation and Sizing Methods: Issues and Guidelines. Led team investigating the key sources of estimation inaccuracies for the US Air Force. Focused on software sizing and estimation techniques. Product: Monograph describing set of checklists to assist estimators in improving sizing and effort estimates. Follow-on project addressed cost estimation issues for the US Air Force’s space systems-related programs.

University of Calgary, January 2006 to June 2008. Adjunct professor of computer science. Collaboration with faculty studying decision-making on software development and maintenance projects.

Pardee Rand Graduate School, September 2006 to May 2010. Affiliate professor in RAND’s graduate school of public policy.

Systems/Software, Inc., January 1993 to February 2002. President. Consulting on software engineering, cost estimation, reuse, technology assessment, process and measurement with various clients, including Fannie Mae, Computer Sciences Corporation, Raytheon, American Management Systems, Nokia, Philips, UK Ministry of Defence, European Commission, US Department of Defense, US Patent and Trademark Office and Oak Ridge National Laboratory. Research and analysis focused on reuse, reliability and other software engineering topics. Specialty was evaluation of technology: effectiveness, productivity, quality, trade-off analysis. Work included assessment of maintenance programs; establishment of measurement programs; technology transfer of software engineering techniques; evaluation of suggested best practices; presentation of courses on measurement, experimental design, software engineering decision-making, and technology assessment. Principal investigator, National Science Foundation grant to investigate retrospective data analysis, 1997 to 1998. Principal investigator, National Science Foundation grant to establish national mentoring program for women and minorities in computer science, 1991-1994. Visiting Research Professor at City University of London, with joint appointment to the Department of Business Computing and the Centre for Software Reliability, January 1993 to September 1995: investigated risk engineering techniques for the ESPRIT-funded GOAL project (Dept. of Business Computing); investigated effect of formal methods on dependability for ESPRIT-funded PDCS project (CSR); for DTI-funded SMARTIE project, investigated effectiveness of standards on quality of process and product (CSR). Reviewer for European Commission’s ESPRIT-funded SQUID project, examining software quality issues. Taught several graduate classes in software engineering for Department of Business Computing and Department of Computer Science. As Visiting Research Fellow with Computer Science Department, University of North London (1993 to 1995), worked on DTI-funded DESMET project, to evaluate effectiveness of techniques and tools on software development.

University of Maryland Computer Science Department, January 1998 to June 2000. Part-time research scientist and visiting professor. Experimental software engineering research, investigating requirements techniques, effectiveness of practices to determine best practices. Funding from National Science Foundation, ITT, others. Teaching: Fall 1998 Honors undergraduate course: Computing: Separating Hope from Hype. Fall 1999: team taught (with V. Basili and G. Travassos) CMSC 435: Software Engineering. Fall 1999 and Spring 2000: Graduate course MSWE 607: Software Life Cycle Processes.

Howard University Center for Research in Evaluating Software Technology, August 1996 to January 1998. Founder and Director of Center for Research in Evaluating Software Engineering. Professor of systems and computer science in the School of Engineering, Architecture and Computer Science. Director of graduate programs in Systems and Computer Science. Director of the research seminar for graduate students and faculty. Director of industrial-academic partnership projects to evaluate the effectiveness of software engineering techniques and tools. Instructor of several software engineering courses, including Research Methods, Senior Project I and II. Principal investigator, National Science Foundation grant in experimental software systems, 1997-1998.

MITRE Corporation Software Engineering Center, August 1991 to January 1993. Principal Scientist. Leader of strategic planning and technology development for MITRE's Software Engineering Center. Investigated software process and product measurement issues, including models and frameworks using metrics to help customers make decisions about appropriate processes for a given problem. Established process improvement group, leading investigations on process and measurement issues. Project manager and technical leader for Metrics Advisor project, a hypertext tool to recommend metrics based on organizational and project goals and needs. Process assessment/improvement and metrics support to Navy, FAA, Defense Medical Systems Support Center, NASA, others. Member, SEI-MITRE-IDA team to define core set of Defense Department metrics. General technical leadership on software engineering issues, including peer review of both internal and customer tasks and products.

Contel Technology Center Software Engineering Laboratory, May 1989 to June 1991. Principal Scientist. Founded and managed Software Metrics Program for Contel Corporation, a \$3 billion telecommunications company. Metrics program identified by Software Engineering Institute as one of the eleven best programs in the U.S. Defined framework for metrics to be collected throughout the corporation. Designed project databases, metrics toolkits. Designed and integrated metrics tools and decision support tools for process and metrics decisions. Established historical database for metrics data. Supervised AIRMICS-funded research project on the economics of software reuse (the first externally funded research and development program for the Contel Technology Center). Supervised metrics project team. Established summer intern program. Led team to market lab services to internal and external customers. Worked with U.S. Department of State on security requirements and the Orange Book certification process. Research in cost modeling, metrics for requirements analysis and specification, metrics for evaluation of new tools and techniques, metrics for maintenance, integration of metrics in CASE tools and development environments. Supported Contel business units by assisting them in identifying problems, applying software engineering where appropriate.

Systems/Software, Inc., January 1983 to May 1989. Vice President: January 1983 to January 1988; President: January 1988 to May 1989. Designed and developed \$1.6 million office automation system for TVA's Office of Natural Resources and Economic Development; established system administrative staff and procedures; developed complete set of automated evaluation tools to determine benefits of system to 2000 users. System analyst for several research-and-development Wang systems. Evaluated series of Wang-based database management systems. Evaluated Navy office automation and communications network. Coordinated training programs for TVA system analysts, for teachers and parents in local school system. Taught Federally Employed Women's National Training Program on office automation. Consultant to Army, Air Force, Navy, State Department, Tennessee Valley Authority, Oak Ridge National Laboratory on Wang computer systems, computer security, software engineering. Designed plan to evaluate secure operating system, developed database to support evaluation. Trained engineers in use of software engineering principles.

System Development Corporation, September 1980 to December 1982. Technical Advisor to Project Control Division. Evaluated existing cost and schedule procedures; designed project control system based on PMS-IV to integrate cost and schedule reporting. Evaluated Computer Systems group; instituted software engineering measures to improve software development performance. Project leader for development of two interactive systems on HP-1000. Project leader for requirements analysis and selection of new computer system. Liaison with customers. Marketing of new customers. Algorithm development to support variety of company projects. General technical advisor to programmers.

Intercon Systems Corporation, August 1978 to August 1980. Senior Analyst. October 1979 to August 1980: Evaluated system design and proposed test plan for large communications system. Evaluated proposals for system enhancements.

Wrote requirements documents; supervised acceptance tests. August 1978 to September 1979: Designed and wrote applications programs for network of PDP-11/70s, including major overhaul of existing code (MACRO assembler, RSX-11D).

PRC Information Sciences Company, September 1976 to August 1978. Senior Associate, November 1977 to August 1978: Member, Applied Research Group. For National Bureau of Standards, reported on methodologies to determine whether a computer system is performing an authorized application. Included evaluation criteria against which to measure each approach and to enable a comparative evaluation. Was member of team to enumerate considerations and trade-offs in developing an interactive computer system. Task included application of operations research techniques to current technological problems. Designed a system to implement the scheduling algorithm evolving from the task. Evaluated proposed system design for the expansion of the National Military Intelligence Center system, including suggestions for database design. Consultant to Georgetown University Medical Center, analyzing data (using SPSS) from the Physicians' Assistant Program. Associate, September 1976 to November 1977: Participated in development of star network of Data General Eclipse and Honeywell 316R computers, driving modified Hazeltine 2000 and teletype terminals plus specialized electronic equipment. System performed message routing and interfaced with similar networks. Designed and implemented queuing and task entry software, systems programs, and device drivers on Honeywell. Task leader for personnel working on Honeywell; supervised four programmers. Generated equations for printing maps on line printer; generated bearing equations for calculating and displaying lines-of-bearing on a CRT.

HRB-Singer, Inc., September 1975 to August 1976. Engineer, Software Development Division. Wrote tape-to-card conversion routines in IBM assembler for use on IBM 360/40; wrote tape-to tape I/O programs in FORTRAN and assembler on PDP 11/45 under DOS. Developed equations and wrote FORTRAN programs to implement map drawing, map projection and satellite orbital calculation software (PDP 11/45 under RSX-11D). Analyzed and generated project data. Headed documentation effort for GACT multi-terminal system; supervised ten people.

The Pennsylvania State University, January 1972 to August 1976. Mathematics instructor, Continuing Education Division, September 1975 to August 1976: Taught calculus classes. Instructor, Department of Mathematics, January 1972 to June 1975: Taught a variety of undergraduate mathematics courses. September 1974 to June 1975: Performed statistical analyses of data gathered at Stone Valley Recreation Area. Developed estimators of hourly population changes in various sections of the recreation area. Produced a simulation model to support decision making and land use planning.

The Anaconda Company, June 1969 to September 1969. Computer programmer. Wrote payroll update and report programs in COBOL and RPG.

AWARDS:

Contel Technology Center and Contel Federal Systems, Citizenship Award, 1989.

Contel Corporation, Citizenship Award, Runner Up, 1989.

Honorary Doctor of Human Letters, Binghamton University, May 2000.

Tower Society Award, Ohio Wesleyan University, 2002.

Luce Foundation Award, 2008.

Most Influential Paper Award: Paper named one of *IEEE Software*'s most influential papers in 25 years.

PROFESSIONAL ACTIVITIES:

Participant in National Science Foundation-funded summer-long Conference on Combinatorial Theory, Bowdoin College, Brunswick, Maine, June 1971.

Consultant, Personnel Standards Committee, National Recreation and Parks Association, January 1975 to January 1976.

Member, State College Municipal Community Appearance and Design Review Board, January 1976 to September 1976.

Secretary, ACM Mid-Southeast Chapter, November 1982 to October 1984.

Vice Chairperson, Knoxville Area Wang User Group, 1987.

Founder and Chairperson, ACM Committee on the Status of Women and Minorities, July 1990 to August 1993.

Principal Investigator, National Science Foundation grant to establish mentoring program for women and minorities in computing, 1991 to 1994.

Principal Investigator, National Science Foundation grant in Empirical Software Systems, investigating experimentation techniques applied to retrospective studies, 1997 to 1998.

Investigator, AIRMICS grant to develop model of the economics of reuse, with Terry Bollinger, 1989 to 1990.

Reviewer for many book publishers and journals, including John Wiley and Sons, Boyd and Fraser, Chapman and Hall, Prentice-Hall, McGraw Hill, Harcourt-Brace-Jovanovich, International Thomson Press, IEEE Computer Society Press, Addison-Wesley publishers, *IEEE Computer*, *Information and Software Technology*, *IEEE Software*, *IEEE Transactions on Systems, Man and Cybernetics*, *IEEE Transactions on Software Engineering*, *Software: Practice and Experience*, *Software Quality Journal*, *Journal of Systems and Software*, *Journal of Information Systems*, *IEEE Spectrum*, *ACM Transactions on Software Engineering and Methodology*.

Member, Software Engineering Institute Software Measurement Working Group, June 1989 to January 1991.

Member, IEEE Committee on Communications and Information Policy, including membership on Subcommittee on Information Security and Applications, February 1992 to January 1993.

Member, *IEEE Software* Industrial Advisory Board, April 1991 to December 1992.

Member, *IEEE Software* Editorial Board, January 1993 to 1998; Associate Editor-in-Chief, January 1995 to March 1997; Editor, Quality Time column, January 1995 to December 1998.

Member, *IEEE Spectrum* Editorial Advisory Board, September 1993 to January 1997.

Associate Editor, *IEEE Transactions on Software Engineering*, June 1997 to 2001.

Member of the Editorial Board, Software Quality Institute series with Prentice Hall, January 1998 to 2001.

Senior Member, IEEE, IEEE Computer Society, IEEE Technical Council on Software Engineering (at-large representative, July 1996 to June 1999).

Book Review Editor, *IEEE Security and Privacy*, 2003 to 2007

Associate Editor, *IEEE Security and Privacy*, 2007 to present.

Advisory Board Member, Virginia Tech Computer Science Department, 2002 to 2006.

Executive Committee, Institute for Information Infrastructure Protection: Vice Chair Elect 2004-2006; Vice Chair 2006 to 2008.

Member, Institute of Medicine Committee, investigating the Food and Drug Administration's 510(k) process for evaluating the safety of medical devices, April 2010 to July 2011.

Invited speaker:

Conference on Pure Combinatorics, Mathematisches Forschungsinstitut, Oberwolfach, Germany, 1971.

6th Annual Conference on Modeling and Simulation, University of Pittsburgh, April 1975.

3rd NATO Advanced Study Institute on Information Science, Crete, Greece, July-August 1978.

IFAC/IFORS Conference on Information Systems, AFCET, Toulouse, France, March 1979.

Eleventh ASIS Mid-Year Meeting, Knoxville, Tennessee, June 1982.

ACM Mid-Southeast Chapter Meeting, Gatlinburg, Tennessee, November 1983.

ACM Southeast Regional Meeting, Atlanta, Georgia, April 1984.

Office Systems Research Association Conference, Atlanta, Georgia, February 1985.

Syntopican XIII, Washington, DC, June 1985.

Annual Conference, International Society of Wang Users, Boston, Massachusetts, October 1987.

CASE '89, London, England, July 1989.

ACM Lecturer Series, Mary Washington College, Fredericksburg, Virginia, October 1989 and October 1991.

Annual Oregon Workshop on Software Metrics, Portland, Oregon, March 1990 and March 1991.

Reuse and Reengineering Symposium, Alexandria, Virginia, May 1991.

Software Quality Week, San Francisco, California, May 1990 and May 1991.

Washington Ada Symposium, McLean, Virginia, June 1990.
ACM Professional Development Lecturer, University of Maryland, November 1990.
3rd Software Quality Workshop, Alexandria Bay, New York, August 1991.
ACM Computer Science Conference, Kansas City, March 1992.
Software Technology Conference, Salt Lake City, April 1992.
CASE '92, Montreal, Quebec (workshop leader), July 1992.
4th Software Quality Workshop, Alexandria Bay, New York, August 1992.
Pacific Northwest Quality Conference (tutorial instructor and invited speaker), Portland, Oregon, October 1992.
British Telecom Reuse Working Group, London, England, January 1992.
European COCOMO User Group Meeting, Reading, England, February 1992.
International Workshop on Software Reuse (IWSR93), Lucca, Italy, March 1993.
Congress on the Quality of Software 93, Milan, Italy, March 1993.
CSR 93 Conference on Software Measurement, Amsterdam, Netherlands, September 1993.
Applications of Software Measurement 93, Orlando, Florida, November 1993.
British Computer Society Reuse Workshop, London, England, March 1994.
BNR Design Forum, Harlow, England, June 1994.
Congress on the Quality of Software 94, Rome, Italy, September 1994.
European Software Methods Conference, London, England, October 1994.
Keynote Speaker, Philips International Software Conference, Eindhoven, Netherlands, February 1995.
European Software Measurement Conference, Rolduc, Netherlands, May 1995.
NASA Software Engineering Laboratory Annual Workshop, Greenbelt, Maryland, November 1995.
National Institute of Standards and Technology Speaker Series on High Integrity Systems, January 1996.
Speaking tour at major Australian universities, February 1996.
Keynote Speaker, Third International Symposium on Software Measurement, Berlin, Germany, March 1996.
Keynote Speaker, ESCOM 96, Manchester, UK, May 1996.
Applications of Software Measurement 96, San Diego, California, October 1996.
Keynote Speaker, International Conference on Building Quality Software, Hong Kong, December 1996.
Keynote Speaker, Empirical Assessment of Software Engineering (EASE) Conference, Keele, UK, March 1997.
International Conference on Software Maintenance, Bari, Italy, September 1997.
Workshop Leader, Workshop on Empirical Studies of Software Maintenance, Bari, Italy, October 1997.
Tutorial Speaker, International Conference on Software Engineering, Boston, Massachusetts, May 1997.
Keynote Speaker, Society for Information Management workshop, Fairfax, Virginia, March 1998.
Invited Speaker, Software Quality Institute annual symposium, Austin, Texas, April 1998.
Keynote Speaker and Tutorial Presenter, European Software Measurement Conference, Rome, Italy, May 1998.
Keynote Speaker, USPDI Testing Conference, Tyson's Corner, Virginia, June 1998.
Distinguished Lecturer, University of Texas, Austin, December 1998.
Tutorial Presenter, Applications of Software Measurement 99, San Jose, California, February 1999.
Invited Speaker, Litton Software Engineering Conference, Dana Point, California, February 1999.
Keynote Speaker, Empirical Assessment of Software Engineering (EASE) Conference, Keele, UK, April 1999.
Paul Rook Memorial Lecturer, European Software Measurement Conference, Herstmonceaux Castle, UK, April 1999.
Keynote Speaker, Brazilian Software Quality Conference, Curitiba, Brazil, May 1999.
Invited Speaker, Federal University of Rio de Janeiro, Brazil, May 1999.
Keynote Speaker, STEP99, Pittsburgh, Pennsylvania, August 1999.
Keynote Speaker, Colorado Advanced Software Institute Annual Symposium, Denver, Colorado, October 1999.

Tutorial Presenter, Applications of Software Measurement 2000, San Jose, California, March 2000.
Graduation Speaker, Harpur College, Binghamton, New York, May 2000.
Keynote Speaker, International Conference on Software Testing, Bethesda, Maryland, June 2000.
Keynote Speaker, Brazilian Software Quality Conference, Joao Pessoa, Brazil, October 2000.
Tutorial Presenter, ESCOM 2001, London, England, April 2001.
Tutorial Presenter, SEKE 2001, Buenos Aires, Argentina, June 2001.
Keynote Speaker, SEKE 2001, Buenos Aires, Argentina, June 2001.
Keynote Speaker, Brazilian Software Quality Conference, Rio de Janeiro, Brazil, October 2001.
Tutorial Presenter and Invited Speaker, Applications of Software Measurement 2002, Anaheim, California, February 2002.
Workshop Presenter, Computer Sciences Corporation Technology Week, Portovenere, Italy, March 2002.
Tutorial Presenter, International Conference on Software Metrics, Ottawa, Canada, June 2002.
Keynote Speaker, 7th European Software Quality Conference, Helsinki, Finland, June 2002.
Keynote Speaker, International Conference on Software Metrics, Sydney, Australia, September 2003.
Distinguished Speaker, University of Colorado at Colorado Springs, April 2004.
Keynote Speaker, SEKE 2004, Banff, Alberta, Canada, June 2004.
Invited Speaker, University of Calgary, Canada, December 2004.
Keynote Speaker and Tutorial Presenter, Software Education Conference, Wellington, New Zealand, March 2006.
Keynote Speaker and Tutorial Presenter, Software Education Conference, Sydney, Australia, March 2006.
Invited Speaker, Ottawa Software Process Improvement Network, Ottawa, Canada, April 2006.
Invited Speaker, Fourth International iTrust Conference, Pisa, Italy, May 2006.
Invited Speaker, Brazilian Software Engineering Conference, Rio de Janeiro, September 2006.
Keynote Speaker, Conference of the Consortium for Computing Sciences in Colleges, Fredericksburg, Virginia, October 2006.
Invited Speaker, AFCEA Conference on Information Assurance, Washington, DC, February 2008.
Invited Speaker, I3P Workshop on Process Control Systems, Houston, Texas, March 2008.
Invited Speaker, Heritage Foundation Roundtable on Cyber Security, Washington, DC, June 2008.
Invited Speaker, Economics Security Working Group, US Department of Commerce, Washington, DC, June 2008.
Invited Speaker, Information Overload Research Group Forum, New York City, July 2008.
Invited Speaker, Residential Workshop on Countering Insider Threats, Schloss Dagstuhl, Wadern, Germany, July 2008.
Moderator, Senate Homeland Security Forum on Cyber Security and Human Behavior, Washington, DC, September 2008.
Invited Speaker, Fourth World Software Quality Congress, Bethesda, Maryland, September 2008.
Keynote Speaker, The Malicious Exploitation of Information Systems: Preventing the Rise of the Insider Threat, University College London, November 2008.
Invited Speaker, Workshop on the Economics of Information Security, London, England, June 2009.
Invited Speaker, Suspicious Behavior and Insider Threat Workshop, Lansdowne, Virginia, September 2009.
Keynote Speaker, Workshop Anual do MPS (Annual Brazilian Workshop on Process Improvement), Campinas, Brazil, October 2009.
Invited Speaker, Software Assurance Forum, Arlington, Virginia, November 2009.
Invited Speaker, SEI Workshop on Insider Threat, Arlington, Virginia, June 2010.

Program Chairperson:

ACM Mid-Southeast Chapter Summer Meeting, Gatlinburg, Tennessee, June 1981.
ACM Mid-Southeast Region 25th Anniversary Meeting, Gatlinburg, Tennessee, November 1984.
ACM Mid-Southeast Chapter Autumn Meeting, Gatlinburg, Tennessee, November 1987.
Fourth International Symposium on Software Measurement, Albuquerque, New Mexico, November 1997.

International Conference on Software Maintenance, Amsterdam, September 2003.

General Chairperson:

Second International Symposium on Software Measurement, London, England, October 1994.

Third Workshop on Empirical Studies of Software Maintenance, Bethesda, Maryland, November 1998.

Organizer, First International Workshop on Assurance Cases, DSN04 (Dependable Systems and Networks), Florence, Italy, July 2004.

PUBLICATIONS:

TEXTBOOKS:

Introduction to Discrete Structures, with David W. Straight. John Wiley and Sons, 1985.

Software Engineering: The Production of Quality Software, Macmillan, 1987, 1991 (second edition).

"The Economics of Reuse," with T. Bollinger, chapter in *The Economics of Information Systems and Technology* edited by R. Veryard, Butterworths Publishers, 1990.

"Setting Up a Metrics Program in Industry," chapter in *Software Quality Assurance and Measurement*, edited by N. Fenton and R. Whitty, International Thomson Press, 1995.

"Integrating Process and Measurement," chapter in *Software Measurement: Understanding Software Engineering*, edited by Austin Melton, International Thomson Press, 1995.

Applying Software Metrics, co-edited with Paul Oman, IEEE Computer Society Press, 1997.

Software Metrics: A Rigorous and Practical Approach, with Norman Fenton, second edition, International Thomson Press, 1997.

"Experimentation in Software Engineering," chapter in *Advances in Computers*, Academic Press, 1997.

"Use Realistic, Effective Software Measurement," chapter in *Constructing Superior Software*, edited by Paul C. Clements, Software Quality Institute Series, Macmillan Technical Publishing, New York, 1999.

Solid Software, with Chuck Howell and Les Hatton, Prentice Hall, 2001.

"Using Mentoring to Advance Females and Minorities in a Corporate Environment," with Norma T. Mertz, chapter 15 in *The Organizational and Human Dimensions of Successful Mentoring Programs and Relationships*, edited by Frances Kochan, Information Age Publishing, Greenwich, CT, September 2002.

Security in Computing, fourth edition, with Charles P. Pfleeger, Prentice Hall, 2007

"Making Executive Mentoring Work in IT," with Norma Mertz, *Encyclopedia of Gender and Information Technology*, edited by Eileen Trauth, Information Science Publishing, 2006.

Software Engineering: Theory and Practice, Prentice Hall, 1998, 2001, 2005 (third edition with Joanne Atlee), 2009 (fourth edition with Joanne Atlee).

Applying Computer Security: A Threat/Vulnerability/Countermeasure Approach, with Charles P. Pfleeger, Prentice Hall, to appear 2011.

INVITED AND SPONSORED PAPERS:

"Path-Cycle Ramsey Numbers," with T. D. Parsons, *Notices of the American Mathematical Society*, February 1973.

"Cycle-Star Ramsey Numbers," *Notices of the American Mathematical Society*, June 1973.

"Bipartite Ramsey Numbers," *Notices of the American Mathematical Society*, October 1973.

"Simulating a Recreational Lake Facility," with G. Kleindorfer, *Proceedings of the Sixth Annual Conference on Modeling and Simulation*, April 1985.

"Simulating a Recreational Lake Facility," with G. Kleindorfer, Center for the Study of Environmental Policy, Paper No. 14, June 1975.

"Computer Safeguards: Application Characteristics," with G. Blomgren and M. Goldstein, National Bureau of Standards Study Paper, June 1978.

- “Interactive Use of Computers in Recreational Planning,” *Proceedings of the Third NATO Advanced Study Institute on Information Science*, July to August 1978.
- “Control of Information: The Political Implications,” *Proceedings of the Eleventh ASIS Mid-Year Meeting*, June 1982.
- “Modeling Office Automation Benefits,” *Proceedings of the OSRA Conference*, February 1985.
- “An Object-Oriented Approach to Knowledge Acquisition,” George Mason University Technical Report, 1988.
- “A History of Software Cost Models,” George Mason University Technical Report, 1989.
- “The Economics of Software Reuse,” with T. Bollinger, Contel Technology Center Technical Report CTC-TR-089-014, December 1989.
- “Recommendations for an Initial Set of Software Metrics,” Contel Technology Center Technical Report CTC-TR-89-017, December 1989.
- “Software Metrics Tools Evaluation,” with Joseph Fitzgerald, Jr., Contel Technology Center Technical Note CTC-TN-090-017, September 1990.
- “Software Estimation for Object-Oriented Systems,” with J. D. Palmer, *Proceedings of the International Function Point Users Group*, November 1990.
- Guest Editor, *IEEE Software* special issue on Measurement-based Process Improvement, with H.D. Rombach, July 1994.
- Series on Experimental Design and Analysis in Software Engineering, *ACM SIGSOFT Software Engineering Notes*, October 1994 through December 1995.
- “Software Engineering: Viewpoint,” *IEEE Spectrum*, January 1995.
- “Reuse Measurement and Evaluation,” *American Programmer*, November 1995.
- Guest Editor, *IEEE Software* special issue on Software Quality on Trial, with B. A. Kitchenham, January 1996.
- “Software Quality: the Elusive Target,” with B. A. Kitchenham, *IEEE Software*, January 1996.
- Guest Editor, *IEEE Software* special issue on Measurement, March 1997.
- “Using Measurement to Support Software Testing,” *Dr. Dobbs’s Journal*, February 1998.
- “Speeding Technology Transfer,” *Managing System Development*, Spring 1999.
- “Making Software Development Investment Decisions,” with John Favaro, *ACM SIGSOFT Software Engineering Notes*, September 1998.
- “Decisions and Delphi: The Dynamics of Group Estimation,” with Martin Shepperd and Roseanne Tesoriero, *Proceedings of the Brazilian Software Engineering Conference*, Joao Pessoa, Brazil, October 2000.
- “Principles of Survey Research,” series in six parts, with Barbara A. Kitchenham, *ACM SIGSOFT Software Engineering Notes*, November 2001 and forward.
- “Solid Software: Is It Rocket Science?” *Proceedings of the 7th European Conference on Software Quality*, Springer, 2002.
- “A Gift of Impact,” book review of *A Gift of Fire*, by Sara Baase, second edition, in *IEEE Security and Privacy*, 2004.
- “Everything You Wanted to Know About Privacy (But Were Afraid to Ask),” book review of *Privacy: What Developers and IT Professionals Should Know*, by J. C. Cannon, *IEEE Security and Privacy*, May-June 2006.
- “Why We Won’t Review Books By Hackers,” with Charles Pfleeger, *IEEE Security and Privacy*, July-August 2006.
- Guest Editor, *IEEE Security and Privacy* special issue on managing security, with Roland Trope and Charles Palmer, May 2007.
- “Insiders Behaving Badly,” with Joel Predd, Jeffrey Hunker, and Carla Bulford, *IEEE Security and Privacy*, July-August 2008, pp. 66-70.
- “Software Metrics: Progress After 25 Years?” *IEEE Software*, November-December 2008, pp. 32-34.
- Guest Editor, *IEEE Security and Privacy* special issue on insider threats, with Salvatore Stolfo, November/December 2009.
- “Addressing Insider Threats,” with Salvatore Stolfo, *IEEE Security and Privacy*, November/December 2009, pp. 10-13.
- Guest Editor, *IEEE Security and Privacy* special issue on usability and security, with Mary Frances Theofanos, to appear in March 2011.
- Guest Editor, *IEEE Software* special issue on software business, with John Favaro, to appear in May 2011.

REFEREED PAPERS:

- “Path-Cycle Ramsey Numbers,” with R. Faudree, T. Parsons and R. Schelp, *Discrete Mathematics*, vol. 10, 1974.
- “Project Control Through Integration of Cost and Schedule,” *Proceedings of APMS-82*, August 1982.
- “A Model of Office Automation Benefits,” with J. N. Cline, *Journal of the Office Systems Research Association*, Spring 1985.
- “Measuring Improved Productivity,” *Journal of the Office Systems Research Association*, Spring 1988.
- “A Transaction Flow Approach to Software Security Certification for Document Handling Systems,” with C. P. Pfleeger, *Computers and Security*, October 1988.
- “The Incorporation of Metrics in CASE Tools,” *Proceedings of CASE '89*, July 1989.
- “Penetration Testing Methodology,” with C. P. Pfleeger and M. F. Theofanos, *Computers and Security*, vol.8, November 1989.
- “The Economics of Reuse: Issues and Alternatives,” with T. Bollinger, *Proceedings of the Annual National Conference on Ada Technology*, March 1990.
- “Software Metrics in the Process Maturity Framework,” with C. McGowan, *Journal of Systems and Software*, July 1990.
- “A Software Metrics Toolkit: Support for Selection, Collection and Analysis” with J. Fitzgerald, *Proceedings of the Eighth Annual Pacific Northwest Software Quality Conference*, October 1990.
- “The Economics of Reuse: Issues and Alternatives,” with T. Bollinger, *Information and Software Technology*, December 1990.
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